A Cashless Society: The Advantages and Disadvantages

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Abstract

The author evaluates the advantages and disadvantages of a cashless society. They analyze the advantages and disadvantages via the public sector. They state that a cashless society lowers costs for businesses and governments. They comment on the whether or not a cashless society would work in an economical and information technological way. Topics covered are what a cashless society is, the history of money, what digital currency is, analyzing a study of digital money readiness, user experience with digital transactions, Bitcoin, the benefits of using online banking in countries with underdeveloped financial systems, the Byzantine Problem, the expenses of using online banking in countries with underdeveloped financial systems, Electronic commerce, the risk of being hacked, open source resources, and new and technology on the rise.
Introduction

From cattle, to services, to paper, money can be many different things. Money finds its worth from being a unit that is exchanged. The start of money began as a bartering system. After the bartering system came the Asian cutlery. As times changed, the Chinese make small bronze utensils to replace big tools. Over time the Chinese got tired of the odd shaped money and began making a circular shape. Thus, came about the first coins. In 600 B.C. Lydia's King Alyattes created the first official currency. The coins were made of a silver and gold mixture that occurred naturally. The coins were stamped to create denominations. The coins increased both internal and external trade. The first to use paper for money were the Chinese. The Europeans were still using coins when the Chinese were using paper, but the Europeans had started using bank notes for depositors. A person could take a bank note to the bank at any time and exchange it for silver or gold coins. This was the first paper money in Europe. The difference it had from the Chinese paper money was that a bank or private institution, not the government, issued European paper money. The first European paper currency was actually issued by the government in the North American colonies. Because the North American colonies are so far away from Europe, this meant that the colonists were often out of cash. The government began an IOU system to keep a currency in the North American Colonies. For instance, in Canada, a French colony, issued soldiers playing cards that were signed by the governor to keep track of spending.
Now that Europe had paper money as well as Asia and North America, international transactions were much easier. Nations would buy and sell currencies. The buying and selling of currencies started the first currency market. Currency value was determined by how stable a country's government was. Thus, if a country had a stable government, they would have an easier time participating in international trades. With the value of currencies fluctuating, currency wars began. In a currency war, “competing countries would try to affect the value of the competitor's currency by driving it up and making the enemy's goods too expensive, by driving it down and reducing the enemy's buying power, or by eliminating the currency completely.” (Beattie, 2016)

Cash transactions are still in circulation, but along came the 21st century where technology is doubling yearly. The 21st century brought about mobile payments and digital money. With everyone carrying around mobile devices everyday money has to adapt to meet the changes of the world.

**Literary Review**

Digital money, by definition, means money that can be electronically transferred from one party to another during a transaction. For example, direct deposit is a form of digital money. Any money that you do not physically hand to another person is digital money. Whether you are using direct deposit for paychecks, or swiping your debit card you are using digital money. Examples of digital money are bitcoins, debit cards, credit cards, Apple Pay, plus many more. It is the building blocks of a cashless society.

Cash transactions and digital cash transactions are similar. On the one hand, a cash transaction involves physical money. A family goes out to eat for dinner. Their bill is $46.53. Naturally, the family pays with a $50 bill. The waiter takes their money to the
cash register and counts back $3.47. The $46.53 the family paid gets counted at the end of the night when the restaurant closes. The $46.53 gets deposited in the bank the next morning when a manager takes the deposit to the bank. Cash transactions are very direct and have no fees on the buyer. On the other hand, digital cash transaction usually involves fees. The biggest difference between the two is the physical aspect.

A cashless society thrives on mobile phones, cloud computing, data analytics, encryption and storage, and near field communication technology (Dodgson, 2015, p. 325) Digital money can be exchanged or transferred to anywhere in the world with a few clicks of a button, thus, a cashless society.

Electronic commerce is a big contributor to a cashless society. Many consumers pay for Amazon Prime, an Amazon service that gives users 2-day free shipping on eligible products. Amazon sells products from computer chargers to home décor to auto parts. Amazon is basically a convenient department store at your fingertips. They are now testing a store where customers do not have to wait in line at the check-out. Customers walk into the store they walk between machines that scan their phones to find their Amazon account. From there a customer picks up all the products they need. When walking out of the store, the machines sense what products the customer has and bills their Amazon account.

Similarly, Hy-Vee has a service where customers can order their groceries online and they will be delivered to the customers home. Imagine a world where you don’t have to leave home to buy the necessities of life.

Every year the Citi Group does a study on how ready countries are for digital money. This study is done to help guide countries to becoming ready for digital money.
The study works by rating 90-country’s digital money readiness against government and market support, financial and telecom infrastructure, the presence of digital money solutions, and consumer propensity to adopt these. Citi Group has three insights that they believe should guide industry investment. First, “One Size Fits All” does not work. All countries have different cultures which builds different markets. Different markets have different needs and are by no means equal in any way to other markets. Just as there is a different approach and outcome to all situations in life, there is a different approach and outcome to all markets. Second, businesses and governments must tailor their approach to the readiness stage of the end-market. As times change, so do the needs of consumers. Changes in demand apply to businesses and governments both. If a country chooses to change to digital money, they better be ready for the new demand that will come with the digital money change. Third, partnerships are critical. (Dave, Shirvaikar, and Baxter, 2015, p. 4) Partnerships refers to industry partnerships. In all transactions, there is a seller involved, who represents the retail industry, a buyer, who is the consumer or public sector, and the ledger keeper, who represents the financial industry. Without partnership in all three industries, the transaction wouldn’t happen at all.

**Pros**

The key reason banks are now taking an interest in digital currencies is that they worry that digital currencies are used to fund illegal activities (Labbé, 2017). Banks now providing online banking is how we see banks becoming involved.

A cashless society has many advantages. First, the user experience of a cashless society is fast and easy. There is such a wide variety of digital ways to transfer money. Online and mobile banking allows users access to most, if not all, services the bank
provides. This is fast and easy, as you don’t have to physically go to the bank to get the services you need. Also, it is accessible all hours of the day allowing customers to use services at any time of the day or night.

Associated with banking is debit and credit cards. Debit cards are connected to a checking account pulling money out of the checking account every time it is swiped. Credit cards might be associated with a bank, or they are associated with a credit card company.

Apple Pay allows you to put your debit or credit card on to your iPhone. In stores where Apple Pay is available, you just wave your iPhone above the Apple Pay device and you’re done. It’s fast and simple.

PayPal is another service that allows digital transactions. Users can link a debit card or credit card to their PayPal account. PayPal is fast and easy as they keep users debit card or credit card number in the users account. That way with just a click of a button a user has paid for his or her transaction. Visa Checkout and Quick Checkout are very similar to PayPal. They keep your debit card or credit card information so you can check out with the click of a button.

Carrying cash is risky. First, when a thief steals cash, they can spend it and we don’t get it back. Second, online purchases can only be made with digital money. Third, reservations can’t be made without a credit card number to put on file. Fourth, using cash does not return us any rewards like a credit card might.

If a thief steals your purse, then you can call your debit card or credit card provider and either close that card or lock your account. When your card is either locked or closed, that thief can’t use any money from that debit card or credit card.
In addition, Bitcoin is a digital currency that is peer-to-peer. Because it is digital payments are sent via the Internet almost immediately with extremely low fees. Bitcoin is unique because once a transaction is made, it is impossible the reverse it, plus it is almost anonymous.

Bitcoin accounts are free and are regulated by digital communities. This allows the currency to have no third party involved in transactions. Bitcoin has its own built in transaction verification and ledger keeper. Transactions are verified by multiple miners to ensure security, then the built-in ledger keeper records the new amounts of each account. The built-in ledger keeper was created in such a way that it gives attackers limited computational resources.

The biggest problem with cryptocurrency is the double spending problem. If a coin has been spent once, then it’s spent again, one person in the transaction gets cheated. Bitcoin solved the double spending problem with its built-in ledger keeper (Zohar, 2015, p. 106).

Bitcoins, being a digital currency, do not have to be exchanged for other currencies when exchanging money across borders. Bitcoin is open source, meaning anyone can access the code. The open source code helps generate more great ideas for Bitcoins, and helps to keep it transparent creating more trust.

Bitcoin was designed to allow miners to create bitcoins until it hits the fixed rate of 21 million bitcoins (Carrick, 2016, p. 2321). The problem of inflation is solved from both the monetary and class power theories. Bitcoin’s use of a fixed rate does not change government spending, nor the unemployment rate (Hung & Thompson, 2016). It directly
stops the currency from being produced so when the supply goes up, the amount of currency does not change.

Another advantage of a cashless society is that in developing countries without developed financial systems, citizens can use online and mobile banking. “Countries which open up to foreign private participation in domestic investment opportunities benefit from technology transfer, synergies in the global supply chain, and resources development” (Blundell-Wignall and Roulet, 2014, p.7). Online banking allows banks to provide services to clients who don’t ever need to actually go to the bank branch. It allows users to take a photo of a check they have received and deposit that check directly into their bank account. For countries without developed financial systems in place, this is an ideal way to organize and keep track of their money.

Cons

A cashless society has disadvantages. First, the Byzantine problem must be solved. The Byzantine problem is that all information in the system needs to be the same, even in the presence of harmful attackers. In any transaction, there is one party receiving money and one party giving the money. If the giving party does not agree, the transaction does not happen. If the receiving party does not agree, the transaction does not happen. Both parties must agree for the transaction to be valid. In most transactions, there is also a third party. The third party is the ledger keeper. The Byzantine problem cannot be solved for a party of 3. For instance, in most transactions there are 3 parties. There is a buyer, a seller, and a ledger keeper. All parties must agree that the transaction will happen. If the ledger keeper tells both parties the transaction should happen, but the seller
tells the buyer the transaction won’t happen, the transaction won’t happen. If the ledger
keeper tells the buyer that the transaction will happen, but tells the seller the transaction
can’t happen, then the transaction doesn’t happen. In both of the above stated situations,
it is unclear to the buyer why the transaction is not happening. Usually this causes the
buyer to have to contact both parties to find out why the transaction did not happen
wasting time and energy (Lamport, 1982).

Second, the adoption of online banking in countries with under developed
financial systems is forcing local banks of that country to offer online banking services.
In business, competitive advantage is what makes a company superior to other
companies. In the banking world, online banking is a competitive advantage that large
banks have over small local banks. Having a web application built is not cheap. Banks
that reside in countries with under developed financial systems will not have a lot of
money. Thus, they will have to spend a lot of money trying to compete with banks that
have online banking available.

Another problem with the adoption of online banking in countries with under
developed financial systems is that bigger banking companies could beat out the small
local banks. If bigger banks take all the customers in a country with an under developed
financial system, that country will never have the opportunity to develop its financial
systems. A country with underdeveloped financial systems of course has an
underdeveloped economy. If these countries are not allowed the opportunity to develop
their financial systems they won’t develop an economy. The demand for money is based
on the Quantity Theory. The Quantity Theory says that the model is based on a
macroeconomics perspective. (Naghshpour, 2013, p. 4)
“The model ascertains that the demand for money is a multiple of the total money expenditures (price times output), which in turn is the nominal gross domestic product (GDP). The equation of exchange is given as follows:

\[ MV = PQ \]

Where \( V \) is the velocity of money (M), which is assumed to be fairly stable over time for a given economy, \( P \) is the price level, and \( Q \) is the output of the economy, at least in a closed economy.” (Naghshpour, 2013, p. 4)

The Quantity Theory displays the fact that countries with underdeveloped financial systems cannot afford to miss out on developing their system. Without the developed system, there is no developed economy. If there is no developed economy there is not a strong reason to use the online banking of companies that do not reside in that country.

Additionally, a cashless society will increase the use of electronic commerce. For instance, “In the US, the total value of retail sales transactions occurring via the Internet rose, on average, 14% annually over the decade to 2015” (Freedonia Focus, 2016). With the rise in electronic commerce more people can buy products online. Being able to buy products online means many physical stores will go out of business due to competitors having the electronic commerce advantage over them.

Using digital money runs the risk of being hacked. There are two common types of hackers, the white hat hackers and the black hat hackers. White hat hackers test their skills against computer security systems just to improve their computing skills. Black hat hackers try to steal, distort, or destroy information they can find after hacking into a security system. (Dewey, 2013) Black hat hackers are the hackers to be worried about. If
money becomes digital, a black hat hacker could potentially hack into an account and steal money.

For instance, Apple has had a big vulnerability in their secure socket layer since the release of iOS 6 in September 2012. Secure socket layers secure the encryption between the web server and bowser. In other words, it protects Internet users from hackers. Apple had written a piece of code that by passed the last step of the SSL/TSL handshake algorithm. Skipping that last step allowed for man-in-the-middle attacks on SSL servers. Man-in-the-middle attacks are attacks where the attacker secretly alters requests to and from the server. (Bland, 2014)

In addition, having cash has advantages. First, paying with cash means no extra transactional fees. Second, once cash is gone, it’s gone. Having cash helps people budget better. Third, paying with cash helps to avoid debt.

In accordance, open source, by definition, means anyone can access the code. Open source resources are used to help better the product or service offered by the resource. Bitcoin is an open source resource. If anyone can access the code for Bitcoin, then someone might be able to override the ledger keeper. Thus, the double spending problem arises again. This problem would also bring a new perspective to the Byzantine Problem.

Also, Bitcoin itself has never been hacked, but the organizations who house user’s Bitcoins have been hacked multiple times. For example, hackers stole more than $60 million worth of Bitcoins in the Bitfinex hack that happened in 2016 according to Bitfinex, (2016). Bitcoin transactions have been hacked frequently since Bitcoin began.
Additionally, all currency possesses a worth. That worth fluctuates on a daily basis, but usually does not fluctuate a lot. For instance, the United States Dollar might be worth $1 vs € 0.93 today, while tomorrow it might be $1 vs € 0.95.

Governments are issuers of most currencies. Their job is to keep the currency’s value as consistent as possible. “When the circulation of liabilities redeemable in base money comes to dwarf the circulation of the base money itself, the day-to-day demand for base money is low and stable compared to that of a pure commodity currency. . . The base money, in contrast, influences the value of the liabilities only so far as redeemability (as, we presume, will be demanded of private intermediaries [see Selgin and White 1994]) disciplines issuers to maintain such a quantity of liabilities that the two values stay roughly on par” (HARWICK, 2016, p.581).

The biggest currency wars are the Pacific Ocean basin, where the American dollar and Chinese renminbi compete, The Atlantic Ocean basin in which American dollar and euro battle, and the Euro-Asian continent that put the euro and Chinese renminbi against each other. These battles not only take place in designated geographical locations, but also in existing international financial markets. (Robert W., 2014, p.24)

Opinion

A cashless society provides us with more advantages than disadvantages. A cashless society makes for more jobs in the computer science and information technology field. Security is a big issue within digital money transactions. Computer science and information technology specialists are finding new ways to improve cyber security and authentication issues daily. The more need we have for security issues, the more people will pursue the computer science and information technology field. In a more general
view, many people will research the security issues to ensure that what they are using is exactly what they want.

Web developers are creating new technology daily. With new technology comes new security technology to keep users and user’s information on the Internet safe. Besides only security technology, web developers work around the clock to ensure all websites, web applications, mobile applications, and servers are running correctly. There is no need to worry about security issues when there is a double layer of protection.

Additionally, with the average American having an attention span of about 8 seconds, the faster and easier a transaction can be, the happier the customer. Most websites are designed around the above stated statistic. The less clicks it takes a user to checkout, the more often they choose that site.

“The retail industry is better placed to realize benefits once factors such as bank account penetration, card penetration, credit monitoring services, logistics (to enable e-commerce fulfillment), etc. are met. Building on top of this infrastructure, retail is well positioned to integrate digital money into the customer commerce journey, and create more convenient, compelling and personalized experiences.” (Dave, Shirvaikar, and Baxter, 2015, p. 21-22)

In accordance, many people like to go home and relax after work. The more services and products offered online means less leaving the home after getting home from work. Also, many electronic commerce websites allow users to make a profile and store that users information. Information stored by most companies is username, password, email address, shipping address, billing address, and credit card information. Keeping
this information allows for minimal typing and very few clicks when buying a product or service online.

Having a cashless society benefits businesses. To illustrate, digital money reduced operating costs of businesses in 2015 by $120 billion dollars. This reduction allows business in retail to lower costs of cash handling. Similarly, the benefits from digitalizing government disbursements from 2014 to 2015 were astounding. It was lowered by $185 billion (Citigroup, 2015 p. 6).

“A study by the World Economic Forum indicates that leakage affects 5-25% of total benefits and accounts for 75% of total losses. Government disbursement through digital money, arguably, has the potential for higher social impact. According to our estimates, aggressive adoption of digital money for social disbursements by Governments globally can results in $200 billion in cost reductions.” (Citigroup, 2015 p. 6)

The Byzantine Problem has been a problem for years. That is until Bitcoin solved that problem. Because Bitcoin transactions involve only two parties, when a transaction does not get approved, instantly both the parties know why. As stated above, the Byzantine Problem cannot be solved for a party of three, but Bitcoins built in ledger keeper means that the cryptocurrency can be exchanged between the two parties without the third party. Also, Bitcoin solving the double spending problem provides a solid base for a currency.

The future of digital money means less terrorism threats. For instance, the government has a record of everyone’s transactions whether we live in a world of digital money or cash. The government having these records digitally will make it easier for them to track a terrorist. The transaction records will immediately be sent to the
governments database and make all records quicker to access. With using digital
transactions, most, if not all, transactions will be recorded in the same way to allow the
government to sift through them faster and make finding records easier. The government
already monitors phone calls and text messages of the United States citizens. What is the
difference if they see what I buy? They will know that I am not a terrorist because I am
not worried about them watching me. If I were worried then they would be worried.

Conclusion

With digital currencies on the rise, a cashless society is clearly on the way for the
United States and many other countries. With digital money already being used, the
adaptation to a lifestyle with no cash will be easier than we think. “MUMBAI: Digital
payments grew 57% year-on-year in the last fiscal with mobile wallets more than
doubling and card payments rising 44%. . .” (Bhakta, 2017).

All in all, a cashless society has advantages and disadvantages. Seeing how
technology has taken over our everyday lives shows us that a society with digital money
and no cash seems to be the way to go. With so many ways to pay for our purchases
digitally, we will soon be a cashless society.
References


